

WHAT IS CLAIMED IS:

1. A water-based drilling mud comprising an aqueous phase wherein the aqueous phase contains an oil soluble polymer in the form of a gel as a fluid loss reducer.

2. A water-based drilling mud as specified in claim 1 which is further comprised of water, at least one viscosifier, at least one fluid loss control agent, at least one weighting agent, an oily phase, and other conventional additives selected from the group consisting of emulsifiers, lubricants, corrosion inhibitors, salts and pH control agents.

3. A water-based drilling mud as specified in claim 2 wherein the water is salt water.

4. A water-based drilling mud as specified in claim 1 comprising:

- (1) from 50 to 90% of the aqueous phase,
- (2) from 0.01 to 0.5% of pH controllers,
- (3) from 0.1 to 5% of viscosifiers,
- (4) from 0.01 to 30% of salts,
- (5) from 0.1 to 3% of emulsifiers,
- (6) from 4 to 60% of weighting agents,
- (7) from 0 to 15% of clays, and
- (8) from 0.1 to 20% of oil soluble polymer in form of a gel as fluid loss reducer, said percentages being based on the weight of the mud.

5. A water-based drilling mud as specified in claim 1 comprising:

- (1) from 55 to 70% of the aqueous phase,

- (2) from 0.1 to 0.3% of pH controllers,
- (3) from 0.4 to 2% of viscosifiers,
- (4) from 0.5 to 15% of salts,
- (5) from 0.5 to 2% of emulsifiers,
- 5 (6) from 10 to 25% of weighting agents,
- (7) from 5 to 10% of clays, and
- (8) from 0.5 to 2.5% of oil soluble polymer in form of
a gel as fluid loss reducer, said percentages being
based on the weight of the mud.

10

6. A water-based drilling mud as specified in claim 1 wherein the oil soluble polymer is incorporated in an amount of 0.1% to 10%, most preferably in an amount of 0.5% to 2.5%, based on the weight of the mud.

15

7. A water-based drilling mud as specified in claim 1 wherein the polymer is an organo-soluble polymer selected from the group consisting of linear polymers, grafted polymers, branched polymers and cross-linked polymers.

20

8. A water-based drilling mud as specified in claim 1 wherein the polymer is prepared from monomers selected from the group consisting of styrene, substituted styrene, alkyl acrylate, substituted alkyl acrylate, alkyl
25 methacrylate, substituted alkyl methacrylate, acrylonitrile, methacrylonitrile, acrylamide, methacrylamide, N-alkylacrylamide, N-alkylmethacrylamide, isoprene, butadiene, ethylene, vinyl acetate, and vinyl
esters of versatic acids containing from 9 to 19 carbon
30 atoms.

9. A water-based drilling mud as specified in claim

1 wherein the polymer is prepared from monomers selected
from the group consisting of styrene, alpha-methylstyrene,
para-methylstyrene, para-tertbutylstyrene, vinyltoluene,
methyl-acrylate, ethyl-acrylate, methyl-methacrylate,
5 ethyl-methacrylate, 2-ethylhexyl-acrylate, 2-ethylhexyl-
methacrylate, butyl-acrylate, butyl-methacrylate,
cyclohexyl-acrylate, cyclohexyl-methacrylate, isobornyl-
acrylate, isobornyl-methacrylate, isobutyl-acrylate,
isobutyl-methacrylate, p-tertiary-butyl-cyclohexyl-
10 acrylate, p-tertiary-butyl-cyclohexyl-methacrylate,
butadiene, isoprene, ethylene, veova, vinyl acetate,
acrylic acid, methacrylic acid, hydroxyethyl-acrylate,
hydroxyethyl-methacrylate, glycidyl methacrylate, and
sodium benzenesulfonate.

15

10. A process for preparing an oil soluble polymer
fluid loss control agent comprising the steps of dissolving
at least one polymer in a hydrocarbon oil to form a clear
solution or a gel, adding an emulsifier to the solution or
20 the gel, and keeping the mixture under conditions of
agitation until a clear creamy mixture is obtained.

11. A process as specified in claim 10 wherein the
agitation is provided by stirring.

25

12. A process as specified in claim 10 wherein water
is added to the mixture under high shear stirring.

13. A process as specified in claim 10 wherein the
30 hydrocarbon oil is selected from the group consisting of
aromatic hydrocarbons, chlorinated aliphatic hydrocarbons,

aliphatic hydrocarbons; cyclic aliphatic ethers, aliphatic ethers and organic aliphatic esters.

14. A process as specified in claim 10 wherein the
5 hydrocarbon oil is selected from the group consisting of synthetic hydrocarbons and organic aliphatic ester.

15. A process as specified in claim 14 wherein the
hydrocarbon oil is a mixture of a synthetic hydrocarbon and
10 an organic aliphatic ester.

16. A process as specified in claim 10 wherein the
emulsifiers is a member selected from the group consisting
of alkyl sulfates, alkyl benzene sulfonates, alkyl
15 ethersulfates, sulfonated oleic acid, alkylphenol
ethersulfates, sulfosuccinates, phosphoric ester, fatty
acid amides, fatty acid amines, fatty alcohol
polyglycolethers, modified fatty alcohol polyglycolethers,
alkyl polyglycosides, modified alkyl polyglycosides,
20 alkylphenol polyglycolethers, fatty acid polyglycolethers,
and sorbitan fatty acid esters.

17. A process as specified in claim 10 wherein the
emulsifier is selected from the group consisting of alkyl
25 ether sulfates and fatty acid amides.

18. A method of lubricating a drilling bit during the
drilling of a well which comprises circulating a water-
based drilling mud in the vicinity of the drilling bit
30 wherein the water-based drilling mud is comprised of an

aqueous phase wherein the aqueous phase contains an oil soluble polymer in the form of a gel as a fluid loss reducer.

5 19. A method as specified in claim 18 wherein the water-based drilling mud is utilized in conjunction with conventional fluid loss reducers.

10 20. A method as specified in claim 18 wherein the method is conducted in the absence of conventional fluid loss reducers.